IN THE SPECIFICATION:

Please amend the specification as follows:

Please substitute the paragraph beginning at page 1, line 9, with the following.

-- This invention relates to an exposure apparatus, a device manufacturing method for manufacturing semiconductor devices, a semiconductor manufacturing plant in which the exposure apparatus has been installed, and a method of maintaining the exposure apparatus. More particularly, the invention relates to an exposure apparatus in which the ~~optic~~ optical axis of exposing light is divided into a plurality of spaces and the spaces are purged independently. --

Please substitute the paragraph beginning at page 3, line 7, with the following.

-- According to a first aspect of the present invention, the foregoing object is attained by providing an exposure apparatus by exposing light emitted from a laser light source such as an F_2 excimer laser, comprising: a plurality of housings provided adjacent to one another in order to cover at least part of the optical path of the exposing light; exposing-light-transparent members provided at boundaries of the adjacent housings; a gas supplier which supplies the interior of each housing with a purging gas; pressure sensors which sense pressures inside respective ones of the housings; and a control unit which controls the gas supplier on the basis of outputs from the pressure sensors in such a manner that pressures within the respective housings will attain respective ones of predetermined pressures. --

Please substitute the paragraph beginning at page 3, line 23, and ending on page 4, line 14, with the following.

-- According to a second aspect of the present invention, the foregoing object is attained by providing an exposure apparatus by exposing light emitted from a laser light source such as an F_2 excimer laser, comprising: a plurality of housings provided adjacent to one another in order to cover at least part of the optical path of the exposing light; exposing-light-transparent members provided at boundaries of the adjacent housings; a gas supplier which supplies the interior of each housing with a purging gas; differential-pressure sensors which sense differences in pressure between adjacent ones of the housings; and a control unit which controls the gas supplier on the basis of outputs from the differential-pressure ~~sensor~~ sensors in such a manner that pressures within the respective housings will attain respective ones of predetermined pressures. --

Please substitute the paragraph beginning at page 4, line 15, and ending on page 5, line 4, with the following.

-- In a preferred embodiment, ~~an~~ a unit which regulates pressure includes pressure sensors provided in respective ones of the housings or differential-pressure sensors provided between the plurality of housings (e.g., directly in the partition walls of adjacent purge spaces), and air conditioners capable of introducing inert gas to respective ones of the housings and exhausting gas from the interior of respective ones of the housings. The air conditioners are operated while adjusting, e.g., the ratio of an amount of inert gas introduced to the amount of exhaust in

accordance with measurement values from the pressure sensors or differential-pressure sensors in such a manner that interiors of the purge spaces attain predetermined pressures. --

Please substitute the paragraph beginning at page 5, line 5, with the following.

-- The plurality of spaces can be classified broadly into an optics space containing members of the optical system, and a drive space containing driving members. The optics space can be divided into a guiding optics space for introducing laser light into the apparatus, an illuminating optics space for illuminating a reticle with exposing light, and a projection optics space for projecting the reticle pattern onto a substrate. The drive space can be divided into a reticle-stage space containing a reticle stage on which the reticle is mounted, a substrate-stage space containing a substrate stage on which the substrate is mounted, and a masking-blade space containing a masking blade. By thus finely partitioning the exposure space, the purge spaces can be reduced in size. This makes is possible to reduce the amount of inert gas consumed and to lower the operating cost greatly. --

Please substitute the paragraph beginning at page 5, line 7, and ending on page 6, line 2, with the following.

-- The inert gas should be one that is inert to reticles and wafers. Examples of inert gas that can be used are nitrogen gas, ~~and~~ helium, etc. Using a combination of inert gases is desirable, such as adopting a helium atmosphere for the optics space and a nitrogen-gas atmosphere for the drive space. --

Please substitute the paragraph beginning at page 6, line 10, with the following.

-- Further, a purge space requiring a high level of cleanliness, as in the case of the projection optics space, should be held at a pressure slightly higher than that of the other purge spaces. This is effective in holding cleanliness-sensitive spaces at a high level of cleanliness. In this case, however, there is the danger that optical performance will be affected if the boundary members are deformed. It is, therefore, necessary to exercise control in such a manner that the differential pressure of neighboring purge spaces will fall within predetermined limits. --

Please substitute the paragraph beginning at page 6, line 21, and ending on page 7, line 20, with the following.

-- The range of differential pressures is decided in accordance with <u>an</u> amount of deformation of a boundary member (optical element) with respect to a difference in pressure, and <u>an</u> amount of change in optical performance, which is found from the amount of deformation. As one example, assume that a certain projection optics boundary consists of a flat plate SiO_2 having a thickness of 3 mm. In such <u>a</u> case, the pressure difference should be on the order of 0.05 to 5 hPa, and preferably on the order of 0.5 hPa. It cannot be said unqualifiedly that the value of 0.5 hPa is optimum because the optimum value differs depending upon the design of the optical system. In the case of this particular example, ~~is~~ <u>it</u> should be so arranged that the pressures for a wafer stage (W), reticle stage (R), illuminating system (S), guiding optics (T), laser (L) and masking blade (MB) be as follows with respect to the pressure of the projection optics (P) (where the unit of pressure is hPa):

$P - 0.5 < W < P - 0.1$

$P - 0.5 < R < P - 0.1$

$R < S < R + 0.5$

$S - 0.5 < T < S - 0.1$

$T - 0.5 < L < S$

$P - 0.5 < MB < P - 0.1$. --

Please substitute the paragraph beginning at page 8, line 2, with the following.

-- The network software provides the display with a user interface for accessing a maintenance database, which is connected to an external network of a plant at which ~~said~~ the exposure apparatus has been installed, the database being provided by a vendor or user of the exposure apparatus. This ~~make~~ makes it possible to ~~obtain~~ attain the advantages discussed below. --

Please substitute the paragraph beginning at page 8, line 8, with the following.

-- A device manufacturing method according to the present invention comprises steps of placing a group of manufacturing equipment for performing various processes, inclusive of the above-described exposure apparatus, in a plant for manufacturing semiconductor devices, and manufacturing a semiconductor device by performing a plurality of processes using this group of manufacturing equipment. --

Please substitute the paragraph beginning at page 9, line 6, with the following.

-- A semiconductor manufacturing plant according to the present invention comprises: a group of items of manufacturing equipment for performing various processes, inclusive of the above-described exposure apparatus according to the present ~~invention;~~ invention, a local-area network which interconnects the group of items of manufacturing ~~equipment;~~ equipment, and a gateway which makes it possible for the local-area network to access an external network outside the ~~plant;~~ plant, wherein information relating to at least one item of manufacturing equipment among the group thereof is capable of being communicated by data communication. --

Please substitute the paragraph beginning at page 9, line 17, and ending on page 10, line 2, with the following.

-- A method of maintaining an exposure apparatus according to the present invention comprises the steps of: providing, by a vendor or user of the exposure apparatus, a maintenance database connected to an external network of a semiconductor manufacturing ~~plant;~~ plant, allowing the maintenance database to be accessed from inside the semiconductor manufacturing plant via the external ~~network;~~ network, and transmitting maintenance information, which has been stored in the maintenance database, to the semiconductor manufacturing plant via the external network. --

Please substitute the paragraph beginning at page 11, line 22, and ending on page 12, line 2, with the following.

-- Shown in Fig. 1 are a reticle stage 1 on which has been mounted a reticle bearing a pattern, a projecting optics unit (lens barrel) 2 for projecting the pattern on the reticle onto a wafer (substrate), and a wafer stage 3 on which the ~~waver~~ wafer has been mounted for driving the wafer in the X, Y, Z, θ and tilt directions. --

Please substitute the paragraph beginning at page 12, line 3, with the following.

-- The apparatus further includes an illuminating optics unit 4 for irradiating the reticle with illuminating light; a guiding optics unit 5 for guiding exposing light from the light source to the illuminating optics unit 4; an F_2 laser unit 6 serving as the light source; a masking plate 7 for masking the exposing light in such a manner that an area other than the pattern on the reticle will not be illuminated; and housings 8, 9 enclosing the reticle stage 1 and wafer stage 3 to cover the ~~optic~~ optical axis of the exposing light. --

Please substitute the paragraph beginning at page 12, line 13, and ending on page 13, line 5, with the following.

-- The apparatus further includes a helium air conditioner 10 for adjusting the interiors of the lens barrel 2 and illuminating optics unit 4 to a prescribed helium atmosphere; nitrogen-gas air conditioners 11 and 12 for adjusting the interiors of the housings 8 and 9, respectively, to a prescribed nitrogen-gas atmosphere; a reticle loading lock 13 and a wafer loading lock 14 used when a reticle and a wafer are carried into the housings 8 and 9, respectively; a reticle hand 15 and a wafer hand 16 for transporting a reticle and a wafer, respectively; a reticle alignment mark

17 used when the reticle position is adjusted; a reticle storage bin 18 for storing a plurality of reticles inside the housing 8; and ~~an~~ a prealignment unit 19 for performing wafer prealignment. The helium air conditioner 10 and nitrogen-gas air conditioners 11, 12 function as gas suppliers for supplying these gases, which are inert with the reticle and wafer. --

Please substitute the paragraph beginning at page 16, line 1, with the following.

-- This apparatus is controlled in such a manner that the pressure inside the lens-barrel space 29 is held constant so as not to be changed by atmospheric pressure. Control of the lens-barrel space 29 is carried out by measuring internal pressure of the lens barrel 2 by the pressure gauge 25c and adjusting the ratio of the amount of helium introduced by the feed pipe 22c from the helium air conditioner 10 to the amount of exhaust exhausted by the feed pipe 23c using control valves (not shown) based upon the measured value of internal pressure. --

Please substitute the paragraph beginning at page 16, line 12, with the following.

-- The control valves, which are provided in the air conditioners 10, 11 and 12, each function to control the ratio of the amount of purging gas supplied to the amount of exhaust, ~~thereby regulating~~ thereby regulating the pressures within the purge spaces 27 to 30. At this time, whichever of the purge spaces requires a high level of cleanliness is held at a pressure higher than that of the neighboring purge spaces. The control valves are controlled by a control unit, which is not shown. By way of example, the control unit controls the control valves based upon the outputs of the pressure gauges 24a to 24d. --

Please substitute the paragraph beginning at page 16, line 23, and ending on page 17, line 21, with the following.

-- The reticle-stage space 28 has its original pressure regulated using control valves (not shown) to adjust the ratio of the amount of helium introduced by the feed pipe 22b from the nitrogen-gas air conditioner 11 to the amount of exhaust exhausted by the feed pipe 23c in such a manner that the differential pressure between the reticle-stage space 28 and the lens-barrel space 29 falls within a predetermined range, with the pressure regulation being performed based upon the value from the differential-pressure sensor 24b provided in the partitioning wall between the reticle-stage space 28 and the lens-barrel space 29. Similarly, the substrate-stage space 30 has its internal pressure regulated using control valves (not shown) to adjust the ratio of the amount of nitrogen gas introduced by the feed pipe 22d from the nitrogen-gas air conditioner 11 to the amount of exhaust exhausted by the feed pipe 23d in such a manner that the differential pressure between the substrate-stage space 30 and the lens-barrel space 29 falls within a predetermined range, with the pressure regulation being performed based upon the value from the differential-pressure sensor 24c provided in the partitioning wall between the substrate-stage space 30 and the lens barrel space 29. --

Please substitute the paragraph beginning at page 17, line 22, and ending on page 18, line 12, with the following.

-- The illuminating optics space 27 has its internal pressure regulated using control valves (not shown) to adjust the ratio of the amount of helium introduced by the feed pipe 22a from the

helium air conditioner 10 to the amount of exhaust exhausted by the feed pipe 23a in such a manner that the differential pressure between the illuminating optics space 27 and reticle-stage space 28 falls within a predetermined range, with the pressure regulation being performed based upon the value from the differential-pressure sensor 24a provided in the partitioning wall between the illuminating optics space 27 and the reticle-stage space 28. Similarly, the space for the masking plate 7 and the space for the guiding optics unit 5 are regulated in such a manner that the differential pressures between the respective neighboring purge spaces are rendered constant. --

Please substitute the paragraph beginning at page 18, line 13, with the following.

-- The pressure within each housing is controlled in such a manner that the amount of deformation of members caused by a difference in pressure with respect to the pressure within the neighboring housing will fall within a range of pressures that will not have a significant effect upon optical performance. More specifically, the range of differential pressures is decided in accordance with the amount of deformation of each of the boundary members 26a, 26b, 26c, which are optical elements, with respect to a difference in pressure, and an amount of a change in optical performance, which is found from the amount of deformation. The pressure difference is adjusted to 0.5 hPa. --

Please substitute the paragraph beginning at page 19, line 1, with the following.

-- In this embodiment, the pressures of a wafer stage (W), reticle stage (R), illuminating system (S), guiding optics (T), laser (L) and masking blade (MB) are controlled so as to fall within the following ranges with respect to the pressure of the projection optics (P) (wherein the unit pressure is hPa):

$$P - 0.5 < W < P - 0.1$$

$$P - 0.5 < R < P - 0.1$$

$$R < S < R + 0.5$$

$$S - 0.5 < T < S - 0.1$$

$$T - 0.5 < L < S$$

$$P - 0.5 < MB < P - 0.1.$$ --

Please substitute the paragraph beginning at page 20, line 3, with the following.

-- Thus, in accordance with this embodiment, the amount of deformation of the end face of a projecting optics unit is reduced in an exposure apparatus that is purged in sections. Further, the levels of cleanliness of the partitioned sections can be ranked and the section most sensitive ~~of~~ to cleanliness can be held at the highest level of cleanliness. --

Please substitute the paragraph beginning at page 20, line 10, and ending on page 21, line 3, with the following.

-- Though one lens-barrel space 29, which is a space within the projecting optics unit 2, is provided in this embodiment, the invention is not limited to this arrangement. For example, the

space within the projecting optics unit 2 may be divided into a plurality of spaces and these may be purged. In such a case, each space within the projecting optics unit 2 would be provided with a pressure gauge and pressure gauges would be provided for measuring the differential pressures between the neighboring spaces. It should be noted that if the space within the projecting optics unit 2 is divided into a plurality of spaces, the lenses of the projecting optics unit perform the role of the partitioning walls between the spaces. Further, in a case where a magnification correction lens in the projecting optics unit 2 moves, the internal space would be divided into a space that includes the magnification correction lens and spaces that include the other lenses. --

Please substitute the paragraph beginning at page 22, line 18, with the following.

-- The method of controlling the pressures within the purge spaces of this embodiment is similar to that of the first and second embodiments. However, since the interior of the drive space 3 is controlled collectively, the apparatus can be constructed more simply and at a lower cost. --

Please substitute the paragraph beginning at page 22, line 24, with the following.

-- (Embodiment of a semiconductor production system) --

Please substitute the paragraph beginning at page 23, line 1, with the following.

-- Described next will be an example of a system for producing semiconductor devices (e.g., semiconductor chips such as ~~IC~~ ICs and LSI chips, liquid crystal panels, CCDs, thin-film

magnetic heads and micromachines, etc.). This system utilizes a computer network outside the semiconductor manufacturing plant to provide troubleshooting and regular maintenance of manufacturing equipment installed at the manufacturing plant and to furnish maintenance service such as the provision of software. --

Please substitute the paragraph beginning at page 23, line 11, and ending on page 24, line 7, with the following.

-- Fig. 4 illustrates the overall system as seen from a certain angle. The system includes the business office 101 of the vendor (equipment supplier) that provides the equipment for manufacturing semiconductor devices. Semiconductor manufacturing equipment for performing various processes used in a semiconductor manufacturing plant is assumed to be the manufacturing equipment. Examples of the equipment are pre-treatment equipment (e.g., lithographic equipment such as exposure equipment, resist treatment equipment and etching equipment, heat treatment equipment, thin-film equipment and smoothing equipment, etc.) and post-treatment equipment (e.g., assembly equipment and inspection equipment, etc.). The business office 101 includes a host management system 108 for providing a manufacturing - equipment maintenance database, a plurality of control terminal computers 110, and a local-area network (LAN) 109 for connecting these components into an intranet. The host management system 108 has a gateway for connecting the LAN 109 to the Internet 105, which is a network external to the business office 101, and a security function for limiting access from the outside. --

Please substitute the paragraph beginning at page 24, line 8, and ending on page 25, line 4, with the following.

-- Numerals 102 to 104 denote manufacturing plants of semiconductor makers which are the users of the manufacturing equipment. The manufacturing plants 102 to 104 may be plants belonging to makers that differ from one another or plants belonging to the same maker (e.g., pre-treatment plants and post-treatment plants, etc.). Each of the plants 102 to 104 is provided with a plurality of pieces of manufacturing equipment 106, a local-area network (LAN) 111, which connects these pieces of equipment to construct an intranet, and a host management system 107 serving as a monitoring unit for monitoring the status of operation of each piece of manufacturing equipment 106. The host management system 107 provided at each of the plants 102 to 104 has a gateway for connecting the LAN 111 in each plant to the Internet 105 serving as the external network of the plants. As a result, it is possible for the LAN of each plant to access the host management system 108 on the side of the vendor 101 via the Internet 105. By virtue of the security function of the host management system 108, users allowed to access the host management system 108 are limited. --

Please substitute the paragraph beginning at page 26, line 4, and ending on page 27, line 3, with the following.

-- Fig. 5 is a conceptual view illustrating the overall system of this embodiment as seen from an angle different from that depicted in Fig. 4. In the earlier example, a plurality of user plants each having manufacturing equipment are connected by an external network to the

management system of the vendor that provided the manufacturing equipment, and information concerning the production management of each plant and information concerning at least one piece of manufacturing equipment is communicated by data communication via the external network. In the example of Fig. 5, on the other hand, a plant having manufacturing equipment provided by a plurality of vendors is connected by an outside network to management systems of pieces of manufacturing equipment, and maintenance information for each piece of manufacturing equipment is communicated by data communication. This system includes a manufacturing plant 201 of the user of the manufacturing equipment (e.g., the maker of semiconductor devices). The manufacturing line of this plant includes manufacturing equipment for implementing a variety of processes. Examples of such equipment are exposure equipment 202, resist treatment equipment 203, and thin-film treatment equipment 204. --

Please substitute the paragraph beginning at page 27, line 4, and ending on page 28, line 3, with the following.

-- Though only one manufacturing plant 201 is shown in Fig. 5, in actuality, a plurality of these plants are networked in the same manner. The pieces of equipment in the plant are interconnected by LAN 206 to construct an intranet and the operation of the manufacturing line is managed by a host management system 205. The business offices of vendors (e.g., equipment suppliers) such as an exposure equipment maker 210, a resist treatment equipment maker 220 and a thin-film treatment equipment maker 230 have host management systems 211, 221, 231, respectively, for performing remote maintenance of the equipment they have supplied. These

have maintenance databases and gateways to the outside network, as described earlier. The host management system 205 for managing each piece of equipment in the manufacturing plant of the user is connected to the management systems 211, 221, 231 of the vendors of these pieces of equipment by the Internet or leased-line network serving as an external network 200. If any of the series of equipment in the manufacturing line malfunctions, the line ceases operating. However, this can be dealt with rapidly by receiving remote maintenance from the vendor of the faulty equipment via the Internet 200, thereby making it possible to minimize line downtime. --

Please substitute the paragraph beginning at page 28, line 9, and ending on page 29, line 9, with the following.

-- The storage device can be an internal memory or <u>a</u> hard disk or a network file server. The software for <u>performing</u> network access includes a special-purpose or general-purpose Web browser and presents a user interface, which has a screen of the kind shown by way of example in Fig. 6, on the display. The operator managing the manufacturing equipment at each plant enters information at the input items on the screen while observing the screen. The information includes model (401) of the manufacturing equipment, its serial number (402), subject matter (403) of the problem, its date of occurrence (404), degree of urgency (405), the particular condition (406), countermeasure method (407) and progress report (408). The entered information is transmitted to the maintenance database via the Internet. The resulting appropriate maintenance information is sent back from the maintenance database and is presented on the display screen. The user interface provided by the Web browser implements hyperlink functions

(410 to 412) as illustrated and enables the operator to access more detailed information for each item, to extract the latest version of software, which is used for the manufacturing equipment, from a software library provided by the ~~vender~~ vendor, and to acquire an operating guide (help information) for reference by the plant operator. --

Please substitute the paragraph beginning at page 29, line 10, and ending on page 30, line 6, with the following.

-- A process for manufacturing a semiconductor device utilizing the production system set forth above will now be described. Fig. 7 illustrates the overall flow of a process for manufacturing semiconductor devices. The circuit for the device is designed at step 1 (circuit design). A mask on which the designed circuit pattern has been formed is fabricated at step 2 (mask fabrication). Meanwhile, a wafer is manufactured using a material such as silicon or glass at step 3 (wafer manufacture). The actual circuit is formed on the wafer by lithography, using the mask and wafer that have been prepared, at step 4 (wafer process), which is also referred to as a "pre-treatment". A semiconductor chip is obtained, using the wafer fabricated at step 4, at step 5 (assembly), which is also referred to as "post-treatment". This step includes steps such as actual assembly (dicing and bonding) and packaging (chip encapsulation). The semiconductor device fabricated at step 5 is subjected to inspections such as an operation verification test and a durability test at step 6 (inspection). The semiconductor device is completed through these steps and then is shipped (step 7). --